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Inventors : Masahito Yoshikawa
 : Hajime Kato
Title : METHOD FOR CONVERTING
 : AROMATIC COMPOUNDS



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PATENT TRADEMARK OFFICE

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DECLARATION OF MASAHIITO YOSHIKAWA

I, MASAHIITO YOSHIKAWA, hereby declare that I reside in Nagoya, Japan, and that I am an employee of Toray Industries, Inc. of Japan.

I graduated in 1986 from the master course at Kyoto University, and received my degree of doctor of engineering from Kyoto University after having studied during 1994-1996 at the California Institute of Technology in the United States.

In 1986, I became an employee in ~~the chemical laboratory~~ at Toray Industries, Inc., and have continuously been an employee of that corporation to the present date. My studies and my professional field relate to catalyst chemistry, especially the synthesis of zeolites.

June 14, 2002
M.Y.

I am one of the inventors of the above-identified U.S. patent application, and am thoroughly familiar with the subject matter thereof. Additionally, I have studied the references cited by the U.S. Patent Examiner in the Official Action dated February 15, 2002. I have determined that the subject matter of the pending application is sharply distinguishable from the cited references.

Each reference discloses a process for converting hydrocarbon compounds using either a CIT-5, an SSZ-31, an a UTD-1 zeolite catalyst, respectively. However, all references disclose only the isomerization of xylene as an example of isomerization. I have detailed experience in the fields of xylene isomerization and dichlorotoluene isomerization, and I have applied for various Japanese patents on xylene isomerization (JP08-27040, JP08-24659 and JP08-24660). From my experience, MFI zeolite catalyst is more suitable for xylene isomerization than MOR zeolite catalyst. And MOR zeolite catalyst is more suitable for dichlorotoluene isomerization than MFI zeolite catalyst. The selection of a suitable zeolite for isomerization depends on the kind of isomerized aromatic compounds. So, even

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if it is described in the prior art that a SSZ-31, a CIT-5 or a UTD-1 is a good catalyst for xylene isomerization, it is not obvious that a particular claimed zeolite is suitable for the isomerization of the specific compounds defined in the claims of our patent application Serial No. 09/601,414.

Isomerization is a reaction within a single molecule. A collision between molecules is not desirable for an isomerization reaction.

Accordingly, I have found that rapid penetration of a molecule through the pores of the zeolite is very important. Our claimed zeolite has a one-dimensional pore system for large aromatic compounds, and such a pore system is unfavorable for the rapid penetration of a large molecule. Smaller crystals of our claimed zeolites give a faster penetration of the molecule. Accordingly, smaller crystals are more suitable for isomerization. However, all of this depends on the particular kind of reaction, the particular pore size of the zeolite and the particular sizes of the aromatic compounds. For example, crystal size may not be important for a zeolite having a 3-dimensional pore-system and the reaction of very small molecules compared with the pore size of the zeolite.

Thus, a person skilled in the science of catalyst chemistry would not think it obvious to refer to isomerization of xylene, as described in the prior art, as being a valid reference point in attempting to discover a catalyst for isomerizing large aromatic compounds such as (a), (b) and (c) as defined at the end of our Claim 1.

The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and thus such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: June 14, 2002

By: Masahito Yoshikawa
Masahito Yoshikawa